

# MUNICIPAL JOURNAL AND ENGINEER

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## Use of Water for Steam Making\*

A BOILER is an apparatus for converting water into steam under pressure. The raw materials used are coal and water, the product steam. The quality of the water is fully as important as the quality of the coal. With small boilers of low efficiency the character of the water does not materially affect the cost of operation, but in large-sized boilers of high efficiency it plays a very important part. Bad boiler waters may cause corrosion, scale, foaming, overheating, leaks and even explosions.

All natural waters are more or less corrosive on account of the presence of dissolved oxygen and carbonic acid, but waters which contain chlorides, nitrates, sulphates, etc., may under certain conditions become very corrosive. Magnesium chloride is extremely corrosive, and that is largely why sea-water is so objectionable. It is sometimes said that sodium chloride is not corrosive, but in the presence of silica it may become so. Steel corrodes somewhat more readily than iron. Waters which are naturally but slightly corrosive may become very corrosive if allowed to become concentrated in the boiler, that is, unless the boiler is occasionally emptied. Blowing off a boiler does not always suffice, as it removes only a small part of the water, hence dissolved substances still remain. Good care of a boiler is therefore a vital necessity, even with the best of waters. Corrosion is increased by mechanical action, that is, movements of the boiler sheet caused by expansion and contraction. Corrosion is likely to occur at points where there is a tendency to movement, and also along the water-line. Occasionally, galvanic action may cause corrosion. Local corrosion is called pitting or grooving.

Scale formation is due to the precipitation of the carbonates and sulphates of calcium and magnesium and other salts from the water; hence hard waters are objectionable. For each salt there are certain conditions which will cause precipitation. Calcium carbonate is quite insoluble after its extra molecule of carbonic acid has been driven off by heat; calcium sulphate becomes almost insoluble above 250° F. (120° C.), while magnesium carbonate is changed to hydrates and precipitates. Scale also contains compounds of iron, silica, alumina, organic matter, etc., in endless variety of composition.

In general, carbonate scales are soft, and form sludge, or mud, rather than true scale. Sulphates, on the other hand, form a hard scale, especially when mixed with magnesia and silica. The sulphate precipitates in a compact, crystalline form, which sometimes can be removed only by hammering. It often happens that different kinds of scales are met with in the same boiler; this is due to the different temperatures of the sheet in different parts and to the circulation of the water. The scale in the tubes is often different from that on the sheets.

Soft scale can be partially removed by blowing off; hard scale cannot. Scales cause a great loss of fuel, lead to the sheets becoming overheated, bring about unnatural movements of the shell through expansion and contraction, and may ultimately cause leaks. This necessitates frequent blow-offs and washings, making the boiler lie idle, thus losing time and labor.

Hard waters invariably form scale, and comparatively soft waters may also do so if the boiler is used too long without being emptied. Concentrated soft waters are almost as bad as waters naturally hard. By proper care, therefore, the fireman can reduce the amount of scale formation as well as corrosion. The greater the hardness, however, the more troublesome will the water be. If grease is present the sludge may become very sticky. In this condition it adheres tenaciously to the plates and causes overheating, which usually occurs in spots.

Foaming is caused chiefly by an excess of alkaline salts, causing the water to form suds as if soap had been added.

This makes the boiler unmanageable, and affects the quality of the steam.

Corrosion due to gases can be largely eliminated by allowing a thin lime scale to form. Corrosion due to chlorides, etc., can be partially obviated by frequently emptying the boiler, thus avoiding the troubles due to concentration. In serious cases of acid corrosion lime or caustic soda may be used. The use of zinc is, in general, of little value.

Nothing will effectually prevent the precipitation of calcium carbonate, but the use of soda will cause some of the calcium sulphate to settle out as carbonate instead of as sulphate, thus making the character of the scale less objectionable. To prevent the adhesion of the scale to the boiler shell, many substances have been used—potatoes, kerosene and all sorts of nostrums, organic and mineral. Nothing has given more general satisfaction than some form of tannic acid. This is reasonably efficient in

\* Abstract of the fourth in a series of six lectures on "The Industrial Uses of Water," given, on Tuesday evenings, before the Polytechnic Institute of Brooklyn, by Consulting Professor George C. Whipple, of the Department of Chemistry.—Lecture of January 30.

preventing the scale from sticking, while its slight action on the iron is not serious if the material be properly used. Tannin and soda ash form the basis of most of the successful boiler compounds, and sell at from fifty cents to one dollar per gallon. They can be made by any engineer for fifteen cents per gallon by purchasing the hemlock extract and soda ash and mixing them in a barrel in proper proportions. A convenient rule is to mix one gallon of hemlock with two gallons of water and add three pounds of soda ash. This extract costs from three to five cents a pound in barrel lots, and the soda ash about two cents per pound. The proportion and the quantity necessary to be used can be varied according to the character of the water. In most cases, boiler compounds are improperly used and do but little good. Their indiscriminate use is wasteful, and generally unsatisfactory. Nevertheless, they may be made to perform certain legitimate functions. Their use needs guidance, not wholesale condemnation. It is said that graft has been responsible in the past for the continued use of many comparatively worthless but expensive compounds.

In many cases feed-water heaters are of use. They are practically water softening plants and as such will be described in the last lecture.

There is no great mystery about the use of water in boilers, but the subject is so complicated that the ordinary engineer ought not to be expected to understand it all. Large steam users are in the habit of asking the professional advice of experts, and in many cases it would pay smaller users to do the same. The analysis of boiler water ought to form a part of an official inspection.

There are five general rules regarding boiler waters and their treatment:

1. Use good water if you can possibly get it.
2. If you cannot get the right kind of water, take what you can get, and make it right before you use it.
3. If you have to use a bad water add a boiler compound and *make it yourself*.
4. Take good care of your boiler. It will do more to keep it in good condition than any unknown boiler compound improperly used.
5. Know the kind of water you are using and secure advice from someone who has not something to sell. Experts' fees are cheaper than coal bills, and less to be dreaded than boiler explosions.

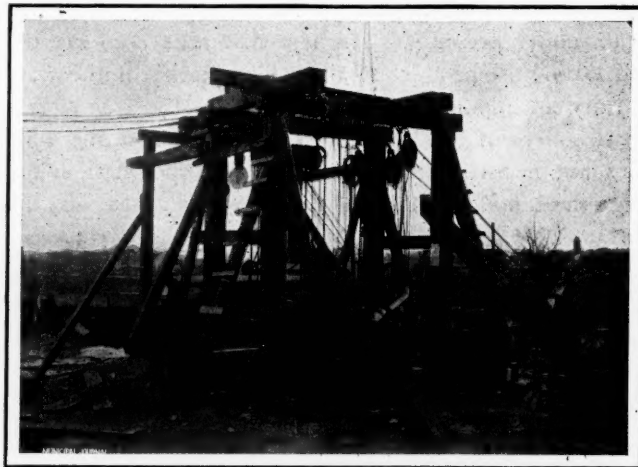
### A Heavy Pumping Contract

THE Torresdale conduit, forming part of the new works for the water supply of Philadelphia, is 14,000 feet long and was constructed in rock tunnel at a depth of about 120 feet. It has an internal diameter of 10 ft. 7 in. and has a shaft at each end. Several auxiliary conduits, at levels near the surface, lead to a clear water basin and pumping stations.

It became necessary to pump out the water which had accumulated in the conduit since its construction, in doing which a serious additional difficulty was anticipated owing to the leakage believed to exist. The work was let to the D'Olier Engineering Company, of Philadelphia, who

selected for its execution De Laval electro-motor centrifugal pumps running at a speed of 1,500 revolutions per minute. Two pumps were used, each capable of delivering 1,200 gallons per minute against a head of 130 feet. These are of the single stage double suction type, with the pump cases divided horizontally, this facilitating access to the working parts. Each pump, with its motor, to which it is connected by a flexible covering, is mounted on a single sub-base, supported by a heavy timber platform swung from steel cables hanging from the head frame of the shaft.

Owing to the restricted space in which the pumps had to be operated it was necessary to place one pump vertically



HEAD-GEAR AT SHAFT NO. 1

over the other; the handling apparatus was so arranged as to allow the pumps to be lowered independently, it being necessary, of course, to do this as the water level receded. At the beginning of the work the water level stood about 30 feet from the top of the shaft. The water in the conduit and the external pressure were then in equilibrium and on the first pumping the leakage was comparatively small. This, however, increased very rapidly as the water level was lowered and finally was such that progress even with two pumps in operation was extremely slow.

When lowering a pump, the other was kept in service, the discharge pipe being lengthened by the addition of flanged sections. In order to avoid strains on the pump flanges the weight of each discharge pipe was carried separately by chain hoists.

After the contractors had been pumping some days, a difficulty arose from the formation of a hard lime deposit or scale in the pump case and in the impeller. The deposit in the case caused no trouble but that on the impeller had the effect of cutting down the quantity of water delivered. This scale was found to be practically pure carbonate of lime and was constantly soluble in very dilute hydrochloric acid. As the volume of water became too great for one pump to handle, it was necessary to avoid shutting down either pump for any period more than a few minutes, and a spare impeller shaft and all running parts of the pump were therefore kept on hand. When a coated impeller was removed the clean impeller was immediately put into position, with but little loss of time,

while the coated impeller could be cleaned at leisure in the acid bath.

It will be readily appreciated that the formation of such a scale would have seriously hampered the operation of reciprocating pumps operated under the same conditions, while it would have rendered useless centrifugal pumps not specially arranged for ready access to the interior, as already noted.

The pumps were primed by the use of check valves kept below the surface of the water. In addition, the pumps were provided with steam exhausters to which connection was made from the steam supply at the surface by means of steam hose.

The contractors installed a very complete plant for supplying electric power to the motors driving the pumps. The plant consisted of two 80 h.p. Ball engines, two Crocker-Wheeler belted dynamos, and two semi-portable boilers, together with pumps, feed-water heater, switch-board, and all the usual accessories of a power plant. In fact, although installed for only temporary service, the plant would be a very efficient and reliable one for permanent use.

Since the conduit has been pumped out, the contractors are obliged to keep the pumps running day and night in order to prevent it from filling up again. On a previous occasion when the pumps were withdrawn, the conduit filled in about one week.

### Street Sprinkling in New York

A DETERMINED effort is to be made, with the support of the Merchants' Association, the West End Association, the City Club, the Transportation Club, the Automobile Club of America and the Society for the Prevention of Cruelty to Animals, to secure the passage of a bill which has been before the New York Legislature for some years. Influences of no ordinary character have been arrayed against it, although, as is evident from a letter recently addressed by Secretary Veiller, of the City Club, to Senators and Assemblymen, the bill is deserving of unstinted support on its merits. The letter reads in part:

"I write you on behalf of the Legislation Committee of the City Club, and also on behalf of the Trustees of this organization, to express our hearty approval of the above mentioned bill. This bill gives to the Street Cleaning Commissioner of the city of New York jurisdiction of sprinkling, sanding and flushing of streets. At the present time this service is performed by a private corporation, organized in the State of Virginia, which makes contracts with the property owners on the various streets to sprinkle in front of their property for a certain consideration each month. This is unquestionably a municipal function and one which should not be delegated to a private corporation. Owing to the careless way in which the streets are sprinkled, irrespective of the atmospheric conditions which exist, there are many serious accidents to horses on account of slipping on the wet asphalt, and also because of the skidding of automobiles for the same reason.

"This measure is one that is desired by all persons own-

ing either horses or automobiles in the city of New York. It is a measure distinctly in the public interest, and I understand it is approved by a number of civic organizations. I respectfully request that a hearing be given upon this bill at an early date, and that the bill be favorably reported by the Committee on Cities."

### Lighting in Three Cities

SEATTLE, Wash., contemplates a considerable extension of its municipal electric lighting plant, and proposes to submit a \$600,000 bond issue to the voters at the coming election. From figures recently submitted by Superintendent Youngs, it appears that \$943,000 has already been expended on this first municipal venture, while President Gill of the City Council remarked, during the debate on the proposed additional outlay, that this was necessary if only as a menace to force the lighting companies to reduce rates.

In New York, a similar step has already been taken, modified by the fact that the city has not expended any funds. Recent discussions in regard to the establishment of municipal plants appears to have alarmed the companies now lighting the streets. For Manhattan and The Bronx, the Edison companies offer a rate of \$80 per arc lamp, subject to an installation of 15,000 lamps, the true significance of this figure lying in its being within \$16 per lamp of the "bed-rock price" estimated as possible, with rigid economy and other favorable conditions, for a city plant. The Consolidated Gas Company offers at the rate of \$12 a year each for the supply and maintenance of 60-candle-power mantle lamps. Adding cost of gas—\$10.36—a saving of \$46,000 for gas lamps alone is shown as compared with the last contract. In Brooklyn, mantle lamps, including gas, work out under the new offer at \$24.28, as compared with about \$30.80.

Boston has had under discussion—in its final stage of a very heated character—the question of buying out the existing lighting companies and of operating the plants as a municipal concern. It was estimated that an initial expenditure of \$62,000,000 would be required—a sum which was probably the chief factor in bringing about the defeat of the measure on February 1. Under the two-thirds rule, fifty votes were required by the advocates of the purchase, while only forty-two, against sixteen opponents, were obtained.

### Municipal Work in Savannah

THE ninth annual message of Mayor Herman Myers affords many indications of progress in this Georgia city. That this is not due to any extravagant policy is shown by the fact that the Mayor hopes shortly to reduce the rate of taxation from \$1.45 to \$1.39, the latter figure, with 10 per cent. discount for prompt payment, representing a \$1.25 rate—one of the lowest in the South. Again, the recently completed City Hall, built and furnished at a cost of \$259,000, will be entirely paid for within the present month, the entire cost of building and equipment having been defrayed from regular revenues. The extras on

this building amounted to only  $1\frac{1}{2}$  per cent. on the original construction contract. Additions to the sewerage system are contemplated, these including the work of completing the house connections; outlying districts are to be supplied with water; the lighting of the streets is to be improved, and the planting of trees is to be undertaken on a more systematic basis.

From other sources we learn that the city is paved mainly with brick and asphalt, and that there is a possibility of the city purchasing an asphalt plant and doing its own work in this department. The city passed unscathed through the recent outbreak of yellow fever in the South.

### City Work in Minneapolis

SOME attention is being directed to the system of direct labor which has grown up in Minneapolis since 1886, when the city began to construct sewers without the intervention of a contractor. Street paving has been carried on under the direct control of the City Engineer since 1899. This applies even to five blocks of asphalt paving laid about four years ago, the asphalt for which was purchased from one of the large companies in that line, a gang of city workmen performing the labor. A natural development of these methods is found in a recent proposal that the city should acquire a quarry and install machinery for rock crushing; asphalt and creosoting plants, the latter for treating wooden paving blocks, are also among the things looked for at an early date.

Contrary to what has been stated of some other cities, a reduction of cost is not among the advantages expected from the direct labor method in Minneapolis. It is stated that whatever apparent gain there may be in this respect is absorbed by the shorter hours of municipal workmen, as compared with contract labor. The real gain is in the quality of the work—the certainty that the money expended hits the spot.

It may be mentioned, in connection with the present reference to street paving, that Minneapolis is one of the cities which debit the cost of paving street intersections to the city as a whole. This step avoids the sometimes knotty problem of apportionment at these points, besides relieving corner-lot owners of an added burden of cost.

### The Sewerage of York, Pa.

It transpired at a meeting of the York, Pa., City Council, February 2, that a further sum of \$400,000 will be required to complete the sewerage works which have been in progress for some time under the engineering control of Messrs. Hering & Fuller, with Mr. Theodore Horton as Resident Engineer. Much of this additional expenditure is due to the refusal of the State Department of Health to permit the discharge of sewage into Codorus creek without treatment. Permission has, however, been granted the city to extend the sewer system under the following conditions:

First.—That all the sewage of the city shall be collected by the new city sewer system and a plan thereof

shall be prepared and filed with the Commissioner of Health on or before March 1, 1906, showing the entire district ultimately to be served by said system, and having marked thereon the sewers of said system built on or before January 1, 1906. At the close of each succeeding year, a plan shall be submitted to the Commissioner of Health showing the sewers added to said system during the year just passed.

Second.—That all storm and roof water shall be excluded from the said system of sewers. Therefore, existing storm sewers must not be taken into said sewer system.

Third.—That the sewage from the said sewer system shall be conveyed to some suitable place and there be treated by some well-known and acceptable process. Plans of the intercepting, outfall and sewage disposal works must be submitted to the Commissioner of Health for his approval, before the same works are built.

Fourth.—That no pathological material from laboratories shall be permitted to discharge into the system. The proper authorities shall cause these wastes to be incinerated on the premises.

Exclusive of the 20 per cent. withheld from contractors' payments, under the customary clause in the specifications, nearly \$291,000 has already been expended on the sewerage system, which, it is estimated, is about 87 per cent. completed.

### The Sewerage of Louisville

THE passage, by the Kentucky Legislature, of a bill providing for the construction of a new sewerage system for Louisville disposes of a leading difficulty hitherto standing in the way of this much needed improvement. The growth of the city since the original system was devised has been such as to exclude consideration of any mere extension of the existing works, and it has therefore been decided to expend \$17,000,000 on works of sewerage and sewage disposal which are expected to place the city in the fore front of sanitary progress in this respect.

An important adjunct to the preparation of the scheme has been the laying down of a modern topographical survey of the territory to be served in the immediate and more distant future, this being of primary importance in view of the large expenditure involved and of the necessary avoidance of former errors in too closely limiting the possibilities of expansion.

A NEW ORDINANCE, recently passed by the Minneapolis City Council, makes it incumbent on all expressmen, draymen, transfer companies and corporations duly licensed by the city, to report all changes of addresses of persons whose effects or household furniture they move from one part of the city to the other. The ordinance is approved by the installment and credit houses, the loan agencies, the postal, telegraph and police authorities of the city. A record to be kept by the License Inspector will be incorporated with the city and telephone directories.

### The Franchise Incubus

THE following extracts from a recent address by Mayor Forster of Rockville, Conn., embody much that has been said before, but conciseness of expression and correctness of sequence are so well combined in his remarks that they deserve more extended perusal:

The recent histories of almost all public service corporations follow the same general lines. First a municipal utility is cornered by methods no matter how piratical, and competition is suppressed. The properties, including franchises, are re-capitalized at considerably more than intrinsic worth, and of course more than cost. Large holdings of new securities are distributed among life insurance companies, fire insurance companies, trust companies and other financial institutions controlled by insiders who, however, retain a safe working control. A comfortable minority interest is disposed of to the investing public at fancy prices in exchange for real money, but the actual majority interest is carefully concealed. Usually handsome returns by way of interest and dividends are paid to the holders of the inflated capital by charging the public exorbitant rates for the service rendered, and a high stock market quotation is easily maintained. Any effort to obtain a reduction of rates is met by the liberal use of those blandishments that appeal to the average legislator, and by the cry that you are imperiling the investments of widows and orphans. It is no wonder that the estates of numerous politicians contain blocks of such stock, or that the common people turn instinctively to municipal ownership of all public utilities. . . .

It is common among the opponents of municipal ownership to allude to it as a fad which will drop out of the public mind like the silver question, and they predict that within five years Americans will not hear anything about it. We might concur in this conclusion if we could diagnose the municipal ownership movement as one of those spontaneous affairs which bespeak a passing discontent with trifles, or if it was advanced as a remedy for an abuse of a trivial nature. It is the product of the same revulsion of feeling that has produced the insurance investigation, the demand for the regulation of railroad rates, the punishment of the beef trust, the government and supervision of corporations, the elimination of graft, a revision of the tariff and pure politics. There is a settled conviction in the minds of the people that the time has come for a square deal. It is not considered a square deal when the right to run cars is made the medium of extortion, or the right to furnish gas and electricity to the people is expanded into a privilege to control legislatures and force the passage of laws that are hostile to the public welfare.

### Village Improvement

PARKERSBURG, W. Va., has a Village Improvement Association on the general lines of that at Stockbridge, Mass., referred to in THE MUNICIPAL JOURNAL AND ENGINEER of January 17 (page 71) as the pioneer organization in this field. Mrs. L. M. Skinner gives an account

of the history and activities of the southern Association in a recent issue of the *Wheeling Intelligencer*, from which it appears that the society was formed four years ago at a meeting attended by seventy-five ladies; the merchants on Market street cordially responded to an appeal asking each to contribute fifteen cents a week for the expenses of a one-man "White Wings" brigade. "Pat," who ranks from General to private in this *corps d'elite* having worked wonders in this line, a more ambitious effort was directed to beautifying a barren and unsightly corner, which was made to blossom as the rose.

Children have been taught not to take short cuts across grass edgings and lawns; others have taken the little corner park into their charge, and boys' clubs have been formed to assist in preserving flowers and grounds from trespassers. Another outlet for the energies of the Association has been found in the improvement of the local cemetery, a work to which Mrs. Skinner points as offering a wide field in many other places. In particular, she advocates the abolition of the mounds usually formed over graves, as has been done at Arlington (Washington) and Mt. Auburn (Cambridge). "The great problems of our day," she writes, "are those of city life. Whatever assists in brightening the lives of different classes of people has a distinct value in the world."

### Paving Repairs in Philadelphia

RECENT reports show that Director of Public Works Acker, who was appointed to that Philadelphia office on May 24 last, is putting pressure on street work contractors to complete repairs called for by their contracts. In one instance, involving work to a total value of \$127,000, the streets needing repairs should have been in good condition by June 1, 1905. The contractor, deceived by his foreman, failed to comply with this provision, and has consequently had to accept \$110,000 in final settlement of his claim as against \$127,000 called for by the contract. Judging from figures compiled by the Bureau of Highways in connection with this settlement, it appears that the present administration has succeeded in effecting large economies in this branch of work. In 1905, 636,579 square yards of repairs cost \$110,000, as compared with 426,201 square yards costing \$144,000 in 1904.

NATURAL GAS IS USED FOR FUEL in the furnaces at the new packing house of the American Dressed Beef and Provision Company in Armourdale, near Kansas City. Four or five boilers in the power plant are equipped with gas burners and the company is using from one-quarter to one-half a million cubic feet of natural gas daily, supplied at the manufacturers' rate of ten cents per thousand cubic feet. It is claimed by Thomas Ruddy, the manager of the plant, that a saving is made on labor, although no tests have been made to determine accurately the relative value as compared with the use of coal. All the big packing houses use large quantities of natural gas in their tinning departments and for branding ham and bacon, but the American Company is the only one using it for fuel in a power plant.

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It is also desired that the facilities furnished by the reference library in this office should be widely known and freely used by those interested in municipal affairs. Visitors will be welcomed and provided with conveniences for search, and inquiries by mail will be promptly dealt with.

NEW YORK, FEBRUARY 14, 1906

## Municipal Employment

THE large works now in progress and to be begun in Baltimore give more than usual importance to the question whether contractors should be required to restrict employment to Maryland voters. It is pointed out, in a recent *News* editorial, that the city "needs every facility it can possibly command in order to carry out the vital schemes of improvement" to which we refer. Mayor Timanus, however, advocates the maintenance of the restriction, although, as our contemporary states, the chief officers of his administration are emphatically opposed to it, as being likely to prove "a heavy handicap on the city in the execution of its improvement plans."

The question has arisen elsewhere and will continue to crop up wherever large works have to be undertaken. So far as ordinary labor is considered, its effects, while often serious in regard to the rate of wages required, are less likely to stand in the way of good service than when it is attempted to confine the selection of specialists to a given city or State. Judging from the fact that several of the leading members of the Sewerage Commission's engineering staff, including Chief Engineer Calvin C. Hendrick, have been drawn from outside, it would appear that the fears of the *News* do not apply to work demanding special skill and experience. This is as it should be. To introduce such a limitation would be well-nigh fatal to efficiency, just as the operation of civil service rules, necessary though these are as a bar to nepotism and corruption, often excludes men of whose experience and competence no doubt can possibly exist but who are unable, from various causes, to conform to the Procrustean standards of a modern examination.

## Mr. Dalrymple on Chicago

In the course of a lecture given in Glasgow last month, Mr. James Dalrymple, General Manager of that city's Tramway Department, referred to his visit to Chicago

at the instance of Mayor Dunne. With an area of 194 square miles—ten times that of Glasgow—and a street railway system serving a population of two millions by the equivalent of 700 miles of single track, he saw in Chicago the making of the finest system in the world. But, with an experience in many European and American cities, he felt that its present condition was the worst he had yet seen. The companies had allowed the plants to run down while the city authorities had been wrangling about the changes to be undertaken. He had given Mayor Dunne his views on the whole situation, but the latter had not yet published his report. The people were determined that a change was necessary, but there was a difficulty in the fact that not all were agreed as to the advisability of municipalizing the service.

## Rivers Pollution in New York State

BILLS introduced in the New York State Legislature, by Senator J. P. Allds and Assemblyman A. C. Wade respectively, are based on the present injury to streams in the Adirondacks, either by the discharge into them of paper-makers' waste or by the devastation of wooded areas for the raw material to supply these factories. In the former case, it will be necessary for paper-makers to install plants for the purification of the very objectionable effluent from their works. As regards the latter point, the plan of placing the forests under the jurisdiction of the Board of Forestry, instead of considering these tracts as hunting grounds only, will tend to preserve them from destruction and, by maintaining a more equable flow, prevent the rivers from dwindling almost to the vanishing point in dry seasons.

There will, of course, be the usual attempt to minimize the evil and to magnify the cost of meeting it. But the paper-makers may find comfort in knowing that, in being asked to treat the water courses of the State as something better than common sewers, nothing more is expected than that they should do as others are obliged to do. The *Surveyor* (London) of January 26 refers to four instances (two of them affecting this particular industry) in which septic tanks and filters were put down last year in England for the purpose of treating trade wastes.

## The Sewerage of Minneapolis

THE southern portion of the city of Minneapolis is to be provided with a sewerage system, for which the next Legislature will be asked to sanction an issue of bonds. This section comprises the greater portion of the city still unprovided with sewerage facilities. With a total city area of fifty-two square miles, no more than one-third of the entire area is so provided.

City Engineer Carl Illstrup estimates the cost of the proposed system at about \$2,000,000, but it is not proposed to construct the entire system at once. The cost of the trunk lines, exclusive of laterals, will be about \$500,000. These will traverse the confines of four wards and drain 3,720 acres of land. The construction of the proposed system includes the driving of a tunnel and the sinking of a shaft entailing an expenditure of \$25,000.

### Talks on Civic Topics

A SERIES of tables by Mayors, dealing with such questions as municipal ownership, the poor and criminals of a great city, is now being given in the Vine Street Congregational Church, Cincinnati. Mayor E. F. Dunne, of Chicago, the speaker on Sunday, February 4, illustrated the difference between public service corporations and other kinds of business, pointing out that if a man is dissatisfied with his grocer or his butcher he may take his trade elsewhere. But with street car service the case stands very differently. "If you enter a street car built to hold twenty and find it occupied by a hundred and twenty, you can do one of two things—pay your nickel or get off."

The speaker dealt at length with the conditions before and after the changes introduced in European cities, especially in Great Britain, by the adoption of municipal ownership of street railway systems and expressed his inability to see any reason "why the people of America can not do in American cities what the people of Europe have done in European cities. The people of this country," he continued, "are beginning to realize the benefits of municipal ownership, and the private ownership of public utilities is doomed."

### Rapid Recuperation

In his annual address, Mayor Cutler of Niagara Falls, N. Y., directs special attention to the satisfactory condition of the city's finances. "January 1, 1905, found the city treasury with a deficit of \$40,000. That is to say, the sum required to meet the unpaid bills and obligations contracted for the city during the year 1904, added to the amount of money raised to defray the expenses of the city for the year 1905, which had been taken and used towards paying the current bills for the year 1904, equalled the sum of \$40,000."

To meet this condition, an additional tax of \$2.08 on each thousand dollars of assessed valuation was imposed, and "bravely met" by the taxpayers, with the result that they not only paid their debts in cash but provided money enough for every city department to pay its operating expenses, to meet all maturing bonds, and to pay the interest on the bonded debt. The Mayor congratulates the citizens on an achievement which left a balance to the good in every fund, this being the first time in the history of the city when such a condition prevailed at the beginning of the fiscal year.

### Street Paving in Plainfield, N. J.

In an address delivered before the Plainfield, N. J., Board of Trade on January 25th, Mr. Frank Bergen, of Elizabeth, referred to the condition of a city's highways as affording a fair and generally accurate indication of the state of civilization that prevails. So far as the local conditions were concerned, he was impressed by the fact that, with a present population of four millions in "the big city" formed by New York and its suburbs—counting Plainfield as one of these—there would be a total of ten millions within a quarter of a century. He could not help

thinking, in this connection, that the New York subways, from which so much had been expected, were in so far a failure that the promised shortening of time between City Hall and Harlem had not been attained.

It remained, he thought, for other places to make their locations more attractive—among other methods, by increased attention to pavements. By means of a map, in which various classes of pavement were represented by different colors, he showed that, in Plainfield, an area of 28,160 square yards between curbs could be permanently improved, in asphalt for \$56,320, in brick for \$70,400 and in wood block for \$84,480. He discussed the relative merits and disadvantages of these three pavements and urged the point that the proposed outlay was the reverse of extravagant for a city containing property valued, even at taxation rates, at \$10,241,000 and owing a public debt of \$345,400—the latter figure being only 3.4 per cent. of the assessed value of property.

### Public Lighting in Albany

THE City Council of Albany, N. Y., has accepted terms offered by the Municipal Gas Company under which the electric lighting of the streets will be performed, during five years beginning June 21 next, at a considerable reduction as compared with the contract now about to expire. A rate of \$98.55 per lamp per year, including repairs, cleaning and the replacing of broken globes, is substituted for a rate of \$116.80 a year with charges for these items in addition which brought up the price to \$122.70. There is thus a saving of \$24.15 per year per lamp, or an aggregate of \$16,615.20 for the 688 lamps now in use. It had been estimated that it would cost the city \$101.61 per lamp to produce electric light by its own plant, so that there is a saving, in the new rates, even over that figure.

There is to be a reduction in the cost of installing new lights, represented by the difference between \$153.80 and \$135.55.

SEWAGE DISPOSAL IN PLAINFIELD, N. J., is the original factor in a suit brought against the city by the American Sewage Disposal Company, of Boston, for alleged infringement of the Glover septic tank patents. A decision by Judge Cross, of the Circuit Court, detailed in the *Plainfield Press* of January 24, is in favor of the city in regard to an application, by the plaintiff Company, for an extension of time to complete its *prima facie* case. The suit was begun in 1902, but no testimony has been taken since May 13, 1903. Judge Cross holds that the cause has been "absolutely dormant for a period of two years and eight months without excuse," and refuses the relief sought.

A TRANSPOSITION.—In our issue of January 17, the two brick paving cuts, on pages 67 and 71 respectively, were transposed. What is shown as "Aborn Street, Providence, R. I." is really "A Main Street in Woonsocket, R. I." and *vice versa*. The Aborn street paving, when photographed, had been laid thirteen years, as stated in the closing lines of the article.

BERLIN, THE GERMAN CAPITAL, which includes, with its suburbs, twenty-seven municipalities, now numbers 3,021,000, an increase of nearly 500,000 in five years. The city proper has a population of 2,034,000.

A GAS FRANCHISE FOR SALISBURY, MD., includes a stipulation that the price be \$1.25 net per thousand until ten million feet per annum are consumed; a reduction of five cents per thousand is to be made for every additional five millions sold, until dollar gas is attained.

A PRIVATE COMPANY IN BERLIN operates the street railway system under a franchise which calls upon the company to pave the tracked streets from curb to curb; to hand over a proportion of its earnings to the city, and to relinquish the plant, free of cost, to the city in 1911.

SMOKE PREVENTION IN BOSTON has not been much of a success in recent years, under the auspices of what was known as the "smoke division" of the Street Department. Its functions have now been transferred to the Board of Health, under the provisions of an act of the Legislature of 1905.

STREET LIGHTING IN MILWAUKEE appears to be in a fair way for settlement for the next five years, the Joint Committee on Street Lighting and Judiciary having recommended to the City Council the acceptance of an offer from the local electric company at a flat rate of \$65 per lamp.

PHILADELPHIA'S BUILDING OPERATIONS in 1905 broke all records. A total of 8,929 permits were issued for 16,958 operations estimated at \$34,822,235, an increase of nearly \$6,000,000 over the value for 1904, and of more than \$2,000,000 over 1903, which formerly held the record with 7,469 permits.

THE DAYTON, OHIO, CITIZENS' ELECTRIC COMPANY has been incorporated with a capital of \$100,000, to be greatly increased later. The company will erect a million-dollar plant, to furnish electric light, heat and power, and claims that it can furnish current at half the rate charged by the present company.

A NATURAL GAS FRANCHISE, granted by Kansas City, Mo., to a local company, stipulates for a supply of natural gas for thirty years at twenty-five cents per thousand, and a return to artificial gas if the natural supply should fail. In that case, however, the rate for artificial gas must not exceed seventy cents.

REVISED BUILDING LAWS, a matter referred to a special Baltimore Commission in March, 1904, within a month after the great fire, are still not forthcoming and there is considerable surprise, not to say irritation, at what is regarded as the neglect of an important item in the city's equipment for improvement work. Mayor Timanus has directed that a call be made for an early meeting of the Commission.

PAVING WORK IN BALTIMORE will hereafter be done under the direct supervision of City Engineer Fendall. Heretofore, each department employed gangs of men to repair streets after pipes had been laid or subways constructed. The change is the result of an effort to centralize responsibility and to reduce expenditures.

STREET PAVING AND REPAIRING WORK, estimated to cost \$200,000, is recommended by a committee of the Atlanta, Ga., City Council. The people will vote on the question at the spring election and upon a similar bond issue for a new City Hall. Mayor Woodward urges the building of a City Hall in his annual message.

THE STREETS OF SAVANNAH, GA., are thus referred to in the annual report of the Director of Public Works: "The condition our asphalt streets are now in and have been in during the last several years indicates clearly that no city should lay on its streets as a pavement any material that can not be kept in repair by its own employees."

HIGH-PRESSURE WATER MAINS FOR MANHATTAN are to be laid by the Continental Asphalt Paving Company, New York, Commissioner Oakley, of the Department of Water Supply, Gas and Electricity, having awarded the contract just before his term expired. The firm was the lowest of eight bidders, the price named being \$2,824.282.

WICKER PARK, on the northwest side of Chicago, has an improvement association which maintains its own force of street cleaners. The cost of membership is two cents per month for every foot of frontage represented, with payment for only one street at corners, and sufficient funds are pledged to guarantee the cleaning of streets and sidewalks every other day.

A ST. PAUL ORDINANCE gives the City Engineer the right to purchase supplies for his department in lots of less than \$200 value without reference to the City Council. The wide interpretation of this provision has led to a veto message by the Mayor, who, while recognizing the existence of the ordinance, believes that the practice should not be encouraged by heads of departments.

STREET SPRINKLING IN GRAND ISLAND, NEB., is carried on as a private enterprise by a citizen, who sprinkles on blocks where the residents agree to pay for this service. As no general agreement can be reached, the sprinkling is not continuous, individual blocks remaining dry and dusty, while those adjoining are duly cared for. The city does no sprinkling, but supplies the water for the private service free of charge.

A NEW FORM OF DAMAGE TO STREET PAVING is revealed by an examination of accounts in New York City. Borough President Ahearn finds bills of \$75,000 to \$85,000 for repairs to asphalt pavements, certified as having been made necessary by "the bonfires of small boys and such like." Items of this character, like the reinstatement of street surfaces over pipe trenches, do not come under the guarantee clause of paving contracts.

## City Brevities

PADUCAH, KY., has under consideration a proposition from the local street car company to light the city.

HARRISBURG, PA., is to have its park system greatly extended, under ordinances recently signed by Mayor Gross.

PASSAIC, N. J., is organizing an Engineering Department, to be presided over by City Engineer Anton Peterson.

WATERLOO, IOWA, has been officially declared a city of the first class, under State laws, having a population exceeding 15,000.

SEATTLE, WASH., has under consideration the appointment of two inspectors, who will stamp all approved meat offered for sale in the city.

FORT WORTH, TEX., proposes to set apart a special fund for constructing street crossings wherever citizens lay sidewalks connecting therewith.

SPOKANE, WASH., plans to have many miles of boulevard drives and to set aside land for parks extending 400 to 1,000 feet from the driveways.

BROOKLYN, N. Y., may be put in direct connection with Coney Island through a subway for which the Brooklyn Rapid Transit Company wishes to bid.

AUSTIN, TEX., is considering the re-construction of the dam on the Colorado river, to replace the one built in 1893 and destroyed by a flood in April, 1900.

BIRMINGHAM, ALA., has been asked by A. O. Wright, of Jacksonville, Fla., whether the city would entertain a proposition for the erection of a garbage plant.

CINCINNATI, OHIO, will consider proposals by President Marx, of the Board of Public Service, looking to the establishment of a municipal garbage plant.

SCHENECTADY, N. Y., has the garbage problem before it in a pressing form, as there will be no place on which to continue the present dumping system after April 1.

PROVIDENCE, R. I., is to have a \$2,000,000 tunnel under College Hill, to connect the N. Y., N. H., & H. R. R. passenger station and the various tracks in East Providence.

BUFFALO, N. Y., has a vacancy for a Police Superintendent at \$3,500 per year. Mayor Adam makes it a condition that candidates must be officers of the regular army or navy.

TOPEKA, KAN., declines to pass an anti-smoke ordinance, on the ground of inability to discover any guaranteed smoke consumer which could be successfully used by manufacturers.

GREENWOOD, WIS., is practically without a governing body, owing to the resignation of two aldermen and the Supervisor, who are tired of the "continual criticism on the part of those opposed to them." Owing to the two-thirds quorum rule, it is impossible to secure a legal meeting of the City Council, even for the purpose of accepting these resignations.

## Trade Notes

THE WEBER STEEL CONCRETE CHIMNEY CO. asks us to state that the general offices of the Company have been removed from 159 La Salle street to Suite 930-934 Marquette Building, 254 Dearborn street, Chicago.

THE INGERSOLL-RAND COMPANY, having secured exclusive control of the product of the Imperial Pneumatic Tool Company, is now able to offer the choice of two distinct lines of tools in a branch of work with which both firms have been long and favorably identified.

A REORGANIZATION of the Colfax Manufacturing Company, of South Bend, Ind., places the younger members of the Studebaker Bros. Manufacturing Company in control, with Mr. Nelson J. Riley as President and Mr. Frederick M. Pitner as Treasurer and General Manager. Improved manufacturing facilities have been provided and the concern will be able to supply orders early in February.

THE HERSEY MANUFACTURING CO., of South Boston, Mass., has issued another of the small leaflets for which it has earned an enviable reputation, setting forth the functions and advantages of the Hersey Detector Meter. As was shown on page 244 of our issue for November, 1905, this appliance is designed for use on fire mains, and is so contrived as to leave the main unobstructed during use in fires while affording an unfailing indication of any flow having taken place through it at other times.

THE AUSTIN MANUFACTURING CO., of Chicago reports business good for this time of the year. The sales for the year 1905 exceeded by 50 per cent. those of previous years. Orders are being booked each week for crushing machinery, contractors' outfits, and well and road machinery. Sales have been made recently to U. S. Government for Manila, P. I., No. 3 crushing plant. Chattanooga Blast Furnace Co., Chattanooga, Tenn., No. 7½ crushing plant. Rio de Janeiro Tramway L. & P. Co., New York, N. Y., No. 5 crusher. Widell, Finley & Co., Mankato, Minn., No. 5 and No. 3 crushing plant. W. & J. Lempiere, Melbourne, Australia, No. 5 crusher. Hunkins-Willis Lime & Cement Co., St. Louis, Mo., No. 3 crushing plant. The U. S. Cement Co., Indianapolis, Ind., No. 6 crusher. Greenleaf Stone Co., Milwaukee, Wis., No. 7½ crushing plant. Wm. McIntyre & Sons, Struthers, O., No. 3 crushing plant. O. K. Building & Construction Co., Oklahoma City, Okla., No. 8 crushing plant. Couch & Franklin, Charleston, W. Va., No. 5 crushing plant. J. M. Hamilton, Marion, Ohio, No. 5 crushing plant. Phil. Wilk, Rushville, Ind., No. 2 crushing plant. Gibraltar Quarry Co., Detroit, Mich., No. 7½ crushing plant. W. J. Neale, Waco, Texas, No. 5 crushing plant. L. H. Stevens, Coffeyville, Kan., No. 5 crushing plant. M. Elmore, Cherry Run, W. Va., No. 5 crushing plant. The Company's 1906 Gyratory Crusher Catalogue, containing nearly 150 pages, will soon be ready for distribution.

## THE WEEK'S CONTRACT NEWS

RELATING TO MUNICIPAL AND PUBLIC WORK—THE CONSTRUCTION FIELD—PROPOSALS AND CONTRACTS—  
SEWERAGE AND WATER SUPPLY, STREET IMPROVEMENT AND LIGHTING—FIRE EQUIPMENT—  
BUILDINGS

## STREET IMPROVEMENTS

Bessemer, Ala.—The matter of paving the business section will shortly be considered by the City Council.

Sacramento, Cal.—Portions of Seventh, Eighth and Ninth streets will be macadamized and cement curbs and gutters laid, and portions of J and K streets paved with asphalt.

San Francisco, Cal.—Bids are being prepared for repaving Ellis street between Market and Larkin streets with asphalt; estimate, \$27,000.

Waycross, Ga.—The City Council may shortly vote on a proposed \$75,000 bond issue for street improvements. Considerable paving will be undertaken.

Aurora, Ill.—The Board of Local Improvements has recommended paving South Lake street with brick.

Elgin, Ill.—National street, Spring street and Du Page street are to be graded, paved and otherwise improved.—Henry Dakin, City Engineer.

Nashville, Ill.—The citizens will shortly vote on an issue of \$40,000 street improvement bonds.

Rock Island, Ill.—The City Council has decided to pave a portion of Sixteenth street with asphalt.

Bloomfield, Ind.—The Stockton Township road bonds have been sold for \$31,255.

Petersburg, Ind.—Plans are being prepared for constructing twenty-five miles of gravel road in Pike County, and bids will shortly be invited.

South Bend, Ind.—Bids will be received, March 1st, for paving several streets with brick and asphalt.—William McNery, Chairman, Board of Public Works.

Vinita, I. T.—The City Council is considering plans to pave the streets.

Covington, Ky.—A petition providing for paving several streets is before the City Council.

Newport, Ky.—The Ways and Means Committee will expend \$50,000 improving the streets.

Baltimore, Md.—A Legislative bill provides for an issue of \$5,000,000, city stock, for paving.—E. Cary Timanus, Mayor.

Ann Arbor, Mich.—Plans have been prepared for paving Williams street; estimate, \$10,000.

North Branch, Mich.—The citizens have voted \$6,500 bonds for side-walks.

Crookston, Minn.—Bids will be open, March 13, for improving Houston avenue, according to plans and specifications.—A. K. Childs, City Clerk.

St. Paul, Minn.—The Ramsey County Commissioners have rejected all bids for macadamizing New Brighton road, and will readvertise.

Hattiesburg, Miss.—The City Council has approved the \$20,000 bond issue for street improvements. It is also proposed to extend the waterworks.—R. W. Houston, City Engineer.

Jackson, Miss.—Legislative bills provide for issuing \$250,000 paving bonds and for paving around the Capitol; one mile of State street may also be paved.—Ramsey Wharton, Mayor.

Kansas City, Mo.—The Park Commissioners have recommended issuing \$500,000 bonds for park and boulevard improvements.—D. B. Holmes, Chairman.

Rochester, N. Y.—The city will have portions of Sullivan, Hoeltzer, Clifford, Fourth, Third and Second streets, Atlantic avenue and Avenue D paved with brick at \$168,050; also portions of Cleveland place, Park and Anderson avenues and Milburn street with asphalt, at \$79,500.

Akron, Ohio.—The Board of Public Service has approved the estimates for improving Alyn, Cross, Berg and Wall streets and Beck avenue; cost \$20,000; a sanitary sewer will also be built in Huron street.—City Engineer Payne.

Bluffton, Ohio.—The citizens have voted \$75,000 to improve Main street; other improvements will also be made.

Canton, Ohio.—Estimates are being prepared for improving Charles, West South, West Third and East Lake streets.

Cleveland, Ohio.—Bids will be received, February 21, for curbing and repaving the dressed block Medina section, and improving several streets.—A. R. Callow, Secretary, Board of Public Works.

## SEWERS

Sharon, Conn.—Bids are asked, until February 16, for constructing a concrete septic tank and gate chamber, two sand filter beds and one sludge bed and main and lateral sanitary sewers.—Willard Baker, President, Sharon Drainage Company; T. H. McKenzie, Constructing Engineer.

Jacksonville, Fla.—Bids will be opened, March 5, for furnishing all material for laying 1,700 feet of twelve-inch cast iron sewer.—B. F. Dillon, Chairman, Waterworks Trustees.

Joilet, Ill.—Ordinances have been passed for a sewer in Chicago street, \$3,718, and water main in South Chicago street, \$1,898.

Tulsa, I. T.—The citizens will vote, February 26, on issuing \$45,000 bonds for completion of the sewer system and \$25,000 bonds for a new school house.

Des Moines, Iowa.—The Board of Public Works has been authorized to advertise for bids for constructing sewers on South Seventh street.

Cedar, Iowa.—Sewers are to be constructed in several streets.—W. A. Cherry, Chairman.

St. Paul, Minn.—The Board of Public Works has ordered a favorable report on the Warrendale sewer system, including a pumping station; cost, \$53,000.

St. Louis, Mo.—The Water Commissioners have plans for constructing main sewers in the Northwestern section; estimated cost, \$200,000.

Buffalo, N. Y.—Bids are asked, February 15, for constructing eighteen, fifteen and twelve-inch tile sewers in various streets.—Francis G. Ward, Commissioner, Department of Public Works.

Patchogue, L. I., N. Y.—Plans are being prepared for water and sewer systems; estimated cost, \$75,000.—Joseph B. Rider, South Norwalk, Conn., Engineer.

Akron, Ohio.—The Board of Public Service has signed a contract for building a \$40,000 sanitary sewer with Hallinan Brothers.

Chillicothe, Ohio.—The resolution authorizing the laying of an eight-inch sanitary sewer in Mulberry street has passed the City Council.—E. S. Wenis, City Clerk.

Cleveland, Ohio.—Bids will be received, February 20, for constructing sewers in several streets.—A. R. Callow, Secretary, Board of Public Works.

Sandusky, Ohio.—Bonds will be issued for building a sewer in West Sandusky street.—J. C. Edie, City Clerk.

St. Marys, Ohio.—Work will begin on the sewer system in the spring, \$75,000 having been appropriated.

Toledo, Ohio.—The resolution to build a sewer in local district No. 18 has passed final reading in the City Council.

Youngstown, Ohio.—The Board of Public Service will probably build a sewer in West Federal street before the pavement is laid.—Frank M. Lillie, City Engineer.

Zanesville, Ohio.—Bids will shortly be invited for constructing a storm sewer in North Seventh street.

Bridgeport, Pa.—An engineer is to be employed to prepare plans for a fourteen-mile sewer system, costing \$150,000.—P. J. Uillon, Chairman, City Committee.

**WATER SUPPLY**

Tampa, Fla.—The city is considering the issue of \$400,000 bonds for purchasing the water plant and \$100,000 for constructing and maintaining a lighting plant.

Alton, Ill.—A syndicate of local men is arranging to purchase the waterworks, which will be remodeled.

Pekin, Ill.—The City Council is considering the petition of Albert Weiss and L. H. Lucas for authority to construct a \$20,000 water plant.

Durant, I. T.—The citizens will vote on issuing \$9,000 water extension bonds, April 3.

Weleetka, I. T.—A light and waterworks plant is to be considered in the spring to take the place of the one destroyed by fire.

Spring Lake, Mich.—A committee of the City Council is considering the construction of municipal waterworks; cost, \$15,000.

Sauk Rapids, Minn.—The people will vote on issuing \$15,000 waterworks bonds.

Hattiesburg, Miss.—The issuing of bonds for improving the water system is being considered.

Jackson, Miss.—Plans will shortly be completed for the proposed waterworks; estimated cost, \$200,000.

Clinton, Mo.—The citizens will vote on issuing \$10,000 bonds for waterworks.

Trenton, Mo.—The matter of issuing \$80,000 bonds for a water system is under consideration.

Fremont, Neb.—The proposition to issue \$10,000 waterworks bonds will be submitted to a vote of the people.

Williston, N. D.—The city has voted to issue \$72,000 bonds for water and light purposes.

Patchogue, L. I., N. Y.—Plans are being prepared for water and sewer systems; estimated cost, \$75,000.—Joseph B. Rider, South Norwalk, Conn., Engineer.

Barberton, Ohio.—The City Council will be asked to appropriate money for installing another air compressor at the waterworks pumping station.

Elyria, Ohio.—Bonds for \$28,000 will be issued for improving the waterworks. New mains will be laid. Preliminary plans are being prepared.

Lima, Ohio.—The Board of Public Works will open bids, February 24, for two additional boilers and other equipment for the water system.

Warren, Ohio.—The people of Girard, Ohio, are considering the proposed installation of waterworks. No action has yet been taken.

Youngstown, Ohio.—The Water Board recommends the establishment of a reservoir and a water meter system.

Oklahoma City, Okla.—Bids will be opened, February 24, for purchasing hydrants and valves for extending the water system.—George Hess, City Clerk.

Stroud, Okla.—Plans have been completed for the water system, \$18,000 bonds

having been authorized.—James P. Freshow, City Clerk.

Parkston, S. D.—Work on the construction of the municipal waterworks will be commenced as soon as the weather permits.

Sherman, Tex.—The city will issue \$10,000 bonds for extending the waterworks system.

Portsmouth, Va.—The City Council has petitioned the Legislature for permission to issue \$5,000 bonds for waterworks.

Walla Walla, Wash.—The proposition to issue \$25,000 bonds for waterworks carried.

Chetek, Wis.—The Village is preparing to establish a water system.

**PUBLIC LIGHTING**

Yellville, Ark.—An electric light plant and waterworks will be installed by H. G. Unversagt, Omaha, Neb.

Stockton, Cal.—The City Council is considering an issue of bonds for a municipal lighting plant.

Wilmington, Del.—The matter of building a municipal electric light plant will shortly be considered in the City Council. The contract with the American Lighting Company expires June 2.

Rome, Ga.—The City Electric Railway Company, which has been granted a franchise, will furnish power to the city.

Waycross, Ga.—Plans are being considered for installing an electric light plant in connection with the waterworks.

De Quoin, Ill.—The City Council has granted a franchise for an electric light and power plant to Dr. T. B. Reagin.

Peoria, Ill.—The residents of the West Bluff system have organized a company to establish an electric light plant.

Windsor, Ill.—The City Council has granted a franchise to Thomas Lefferge to operate an electric light plant.

Chickasha, I. T.—The City Council has extended the electric light franchise of Judge Holmes and associates, and extensive improvements will be made in the plant.

Ottawa, Kan.—The City Council is considering the purchase of the electric light plant.

Monroe, Mich.—A committee has reported that a municipal lighting plant can be installed for \$3,700; a \$5,000 appropriation may be made by the City Council.

Muskegon, Mich.—Mayor Fleming recommends that \$15,000 be expended in equipping the old waterworks building with machinery for a municipal lighting system.

St. Cloud, Minn.—Plans are being prepared for the construction of a \$65,000 gas plant.—A. G. Whitney.

Clinton, Mo.—The question of issuing bonds for \$30,000 for electric light purposes will shortly be determined by vote of the people.

Cleveland, Ohio.—Bids are invited for arc lamps, wire and accessories for extending the municipal lighting plant.—A. R. Callow, Secretary, Board of Public Works.

Cleveland, Ohio.—Bids will be opened, February 21, for an electric light and power

plant for the City Hall.—A. R. Callow, Secretary, Board of Public Works.

Pendleton, Ore.—Arrangements for establishing a gas plant are being made by Dr. F. W. Vincent of the North Western Gas & Electric Company; 16,000 feet of mains will be laid, and \$20,000 expended.

Oil City, Pa.—Proposals will be received, February 20, for lighting the streets for ten years.

Tyler, Tex.—The County Commissioners will construct an electric system to light the entire Smith County.—Judge Lindsey, County Commissioner.

Coalville, Utah.—Bonds, \$5,000, have been voted to improve the electric light plant.

Milwaukee, Wis.—Mayor Rose has signed the ordinance providing for a \$450,000 bond issue for a municipal lighting plant.

**FIRE DEPARTMENT SUPPLIES**

Marysville, Cal.—The City Council has decided to build a hose house.

Sterling, Ill.—Uniforms are to be purchased for members of the Fire Department.

Detroit, Mich.—The Fire Commissioners recommend the purchase of additional fire engines and other apparatus.

Sauk Rapids, Minn.—The citizens have decided to again vote on issuing \$15,000 bonds for fire protection.

Red Wing, Minn.—The Fire Chief recommends the purchase of an aerial truck.

Cortland, N. Y.—The Village Board is considering the purchase of fire engines.

New York, N. Y.—Bids will be received for purchasing 4,000 feet of 2½-inch cotton jacket rubber hind hose.—Francis Lantry.

Savona, N. Y.—The Village Board has decided to purchase fire apparatus.

West Seneca, N. Y.—A special election will be held to decide the question of issuing bonds for new fire apparatus.

Lorain, Ohio.—The Board of Public Safety recommends purchasing a \$5,000 truck ladder outfit for the engine house at South Lorain.

Lorain, Ohio.—The Board of Commissioners has petitioned for an issue of \$15,000 fire protection bonds.

Oklahoma City, O. T.—The contract for building the new fire station at Columbus avenue and Hudson street has been awarded to W. A. Van Meter, for \$5,725. Arnold & Wetherbee have the electrical contract.

Allegheny, Pa.—The Board of Directors of Public Safety recommend erecting a new engine house.

Pittsburg, Pa.—The residents of Beechview have petitioned for improved fire protection.—L. E. Smith, Secretary.

Reading, Pa.—The City Council authorizes the purchase of an engine and hook and ladder truck by issuing \$10,000 bonds.

Kingston, R. I.—The citizens of North Kingston are petitioning to improve the fire protection.

Providence, R. I.—The Finance Committee recommends the purchase of four fire engines.

Fort Pierre, S. D.—The Fire Company is to be reorganized.

Chattanooga, Tenn.—A new fire station will be erected by Joseph Trimby on plans by Architect R. H. Hunt. The cost will be \$11,435.

Chattanooga, Tenn.—The Board of Public Works will expend \$2,000 purchasing fire apparatus, including several thousand feet of hose and new chemical engine.

Chattanooga, Tenn.—The residents of the West Side have petitioned for improved fire protection.

Huntington, West Va.—The question of providing adequate fire protection is before the City Council. It is proposed to build waterworks.

Manitowoc, Wis.—An additional fire team, hose wagon, hose and record gauges are to be purchased.

#### PUBLIC BUILDINGS

Little Rock, Ark.—The plans for the proposed \$150,000 City Hall will be prepared by Architect C. L. Thompson.

Colton, Cal.—The matter of issuing \$18,000 school bonds is under consideration.

Monrovia, Cal.—The Board of Trade has recommended an election for issuing \$25,000 bonds for a new High School building.

Newton, Ga.—On February 17, an election will be held to decide the question of issuing \$20,000, four per cent. Baker County Courthouse bonds.

Joilet, Ill.—The City Council has voted to join with Will County in building a \$7,000 pest house.

Quincy, Ill.—The City Hall, recently destroyed by fire, will be rebuilt.

Wolf Lake, Ind.—The citizens will vote, February 22, on issuing \$11,000 bonds to aid in constructing the South Bends and Fort Wayne station.

Cotteyville, Kan.—Bonds, \$35,000, will be issued for erecting a High School building.

Mankate, Kan.—Proposals will shortly be asked for building the new City Hall. Plans have been prepared.

Kansas City, Mo.—The Board of Education is negotiating for a site for the proposed new High School.—C. A. Smith, architect.

St. Louis, Mo.—Plans and specifications

are being prepared for a new building for Police Headquarters.—James A. Smith, Building Commissioner.

St. Louis, Mo.—Plans and specifications have been prepared for constructing the new twenty-room, fire-proof school building at Eighth and Ann streets. The cost will be \$136,000.

Cleveland, Ohio.—Bonds will be issued for \$350,000 for constructing a new manual training school.

Bedford, Pa.—The Westmoreland County Commissioners will again ask bids for the purchase of Courthouse bonds aggregating \$1,000,000.

Wards, S. C.—Bonds, \$5,000, will be issued for erecting a new school house.

Nashville, Tenn.—The citizens will vote on \$150,000 bond issue for a new Courthouse, March 8.

Eagle Pass, Tex.—An election will be held to decide the question of issuing \$50,000 school house bonds.

Greenville, Tex.—The issuing of \$17,000 school house bonds will be passed on at an early election.

Hemphill, Tex.—A \$30,000 bond issue will probably be made for constructing a new Courthouse.—J. A. Watson, County Clerk.

Roscoe, Tex.—The citizens have voted to issue bonds for erecting a school house.

Palestine, Tex.—An election will be held shortly to decide the question of issuing \$20,000 school bonds.

Fairfax, Va.—The Fairfax County Board is considering the issue of \$100,000 bonds for a new Courthouse.

Chelan, Wash.—An election will be held shortly to decide the question of issuing school bonds.

Milwaukee, Wis.—The Board of School Directors have petitioned for an issue of \$5,000 bonds for erecting a new school building.

Milwaukee, Wis.—The Park Commissioners have petitioned for an issue of \$25,000 bonds for erecting an animal house.

West Allis, Wis.—Plans are invited for a City Hall to be built when the village is incorporated.

Winnipeg, Man.—An appropriation of \$100,000 has been made for a new police station.—Thomas Sharpe, Mayor.

#### MISCELLANEOUS

Redondo, Cal.—An election will be held shortly to pass an issue of \$100,000 municipal improvement bonds.

San Diego, Cal.—The City Council has granted a franchise to Lloyd S. Ackerman, to construct and operate a street railway system.

Santa Monica, Cal.—Bids are asked for installing a plant capable of consuming ten tons of garbage per day.—J. C. Hemingway, President, Board of Trustees.

Stockton, Cal.—The Bond Commission has recommended spending \$20,000 for a garbage destructor.—R. C. Tumelty, City Engineer.

Stockton, Cal.—The City Council is considering the issue of \$700,000 bonds for municipal improvements.

Alamosa, Cal.—State Engineer Jaycox, Commissioner Chapman of Conejos County and Commissioner Meyer of Costilla County will locate a \$7,500 bridge over the Rio Grande river.

New Haven, Conn.—The government has condemned the bridge at Grand avenue, and a new structure will be built by the city.

Washington, D. C.—Bids will be received, February 28, for furnishing 12,000 barrels of Portland cement to be delivered at the Soldiers' Home.—John Stephen Sewell, Captain Engineer Corps, U. S. Army, Washington Barracks.

Atlanta, Ga.—Proposals will be received, February 20, for furnishing gymnasium apparatus at Fort Caswell, Wilmington, N. C.—Lieutenant Colonel Sam. R. Jones, Chief Quartermaster.

Savannah, Ga.—The construction of a municipal asphalt plant to repair the streets is urged by the Mayor in his annual report.

Haley, Idaho.—Bids will be opened, February 20, for a bridge over Lost river.—Geo. A. McLeod, County Clerk.

Aurora, Ill.—Two bridges, one with a span of 153 feet and the other sixty feet, will be built over the river at Fox street.—H. B. Douglas, Mayor.

Belvidere, Ill.—The Town Clerk will open bids, February 17, for one span steel bridge 41 feet long with fourteen-foot roadway.

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**OREGON, ILLINOIS**

Princeton, Ill.—A petition is being circulated for a new bridge over the Rum river at Wyanett.—Isaac Martin, Chairman.

Pauls Valley, I. T.—The citizens have voted \$28,000 bonds for public improvements.

Emporia, Kan.—The Board of County Commissioners will open bids, February 27, for constructing bridges at the following places: A steel bridge over Allen creek, a stone arch bridge over 142 creek, and a steel bridge over Elm creek.—W. F. Eggers, County Clerk.

Ottawa, Kan.—The City Council is negotiating for the purchase of the plant of the Ottawa Water and Light Company, and it will be improved.

Newport, Ky.—The matter of erecting a garbage reduction plant is being discussed.—City Clerk Cribbs.

Muskegon, Mich.—A new bridge is to be built over the Ryerson creek at Wood street.—C. S. Cramble, City Engineer.

Port Huron, Mich.—Bids will be opened, March 30, for constructing a Bascule and also a counter-balance bridge.—R. D. O'Keefe, Superintendent of Public Works.

Minneapolis, Minn.—Proposals will be received, until February 23, for furnishing quantities of cedar blocks, sandstone paving blocks, creosoted wood blocks, vitrified paving blocks and crushed limestone.—B. H. Durham, Street Engineer.

Minneapolis, Minn.—The City Engineer is preparing plans for a bridge at Third avenue, and the voters will pass on the matter at the coming election.

Greenville, Miss.—Bonds, \$25,000, will be issued for purchasing land for an agricultural station.

Hattiesburg, Miss.—The matter of issuing \$200,000 improvement bonds is under consideration.

St. Louis, Mo.—Plans have been prepared for a 48-foot span, concrete bridge, over the River des Peres, on the Old Manchester road; cost, \$15,000.—K. W. Valliant, Street Commissioner.

Albuquerque, N. M.—A \$15,000 crematory is to be erected.—Pitt Ross, City Engineer.

Jamestown, N. Y.—Plans have been prepared for a concrete bridge at the boat landing; estimate, \$14,000.

Niagara Falls, N. Y.—On account of the suit brought by the city the Niagara Falls Hydraulic Power and Manufacturing Company will build bridges across the river at Third and Fourth streets.

Niagara Falls, N. Y.—The Board of Public Works has approved the plans of the

Erie Railroad for an overhead crossing at Pine avenue.

Rochester, N. Y.—The County Commissioners have been petitioned to build a bridge across the Genesee river, connecting the Ridge road.

Akron, Ohio.—The construction of a sewage disposal plant is under consideration. The cost is estimated at \$125,000.—Paul D. Hansen, Assistant Engineer, State Board of Health.

Cincinnati, Ohio.—The erection of a municipal garbage crematory is being considered.—W. S. Marx, President, Board of Public Service.

Cleveland, Ohio.—City Engineer Carter has recommended a new high level bridge on Superior avenue and a lift bridge at St. Clair avenue.

Cleveland, Ohio.—The City Council has authorized the expenditure of \$92,000 for installing a high-pressure service in the down-town section. An ordinance appropriating \$6,000 for equipping a City Hall lighting plant has been approved; also an appropriation of \$40,000 for purchasing electrical supplies.—A. R. Callow, Secretary, Board of Public Service.

Springfield, Ohio.—A \$250,000 viaduct will probably be built over the Big Four and Pennsylvania Railroad tracks at South Limestone street.

Braddock, Pa.—An ordinance is being considered for a franchise for an underground conduit system for the Pittsburg & Allegheny Telephone Company.

Carthage, Tenn.—A company, headed by J. W. Williams, will construct a \$50,000 bridge across the Cumberland river.

Elizabethtown, Tenn.—Plans for rebuilding the bridges recently washed away are in progress.

Memphis, Tenn.—The city is considering an issue of additional bonds for public improvements.

San Antonio, Texas.—The city will petition the Attorney General for authority to issue \$20,000 bonds for municipal improvements.

Seattle, Wash.—An ordinance appropriating \$30,000 to start construction of a garbage crematory is being considered.—R. H. Thompson, City Engineer.

Seattle, Wash.—The County Commissioners have received permission from the War Department to construct a combination draw bridge across the Snoqudlmie river at Cherry Valley.

Marinette, Wis.—The Menominee and

Marinette County Commissioners will build a bridge across the river.

Milwaukee, Wis.—The Department of Bridge Engineering will be re-established for preparing plans and specifications for bridges and viaducts, instead of permitting bidders to present their own plans.

Racine, Wis.—John Giest, Milwaukee, has completed plans for a swing bridge with 240 foot span, 84 feet in the clear for draws or channels on either side, with solid concrete approaches; estimated cost, \$67,000.

Winnipeg, Man.—A resolution appropriating \$2,000,000 for public improvements, is being considered by the City Council.

## Fire Department Equipment.

The City of Belleville, Illinois, will purchase the newest and best hose wagon equipment for two fire engine houses. Dealers please forward catalogues, terms and other particulars.

FRED J. KERN, Mayor,  
Belleville, Ill.

February 9, 1906.

## TRACTION ENGINE FOR SALE

One 25 H. P. Traction Engine, with 30 H. P. Boiler, Reeves & Co. make; has only been used about two weeks; guaranteed as good as new; has smooth wheels instead of spur wheels. Will sell reasonable if sold at once, as we have absolutely no use for same. THE WADSWORTH STONE & PAVING CO., 405 Bessemer Building, Pittsburg, Pa.

## AGENTS WANTED

to solicit contracts for a street or road pavement possessing many advantages over present roads. New in this country, but successfully laid in Europe for the last thirty years. Address "Municipal," care of MUNICIPAL JOURNAL AND ENGINEER, New York.

## PARTNER WANTED

Civil Engineer or business man with Capital of \$5,000 to \$10,000 wanted in Engineering Company as active partner. Established business with good prospects; agreeable position. S. W. H., P. O. Box 206, Madison Sq., New York.

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**For Machines to Drill, Blast and Test Holes and Water Wells, write "LOOMIS CO. TIFFIN, O."**

## Proposals

### Notice to Valve and Hydrant Manufacturers

Sealed proposals will be received by the city clerk of Oklahoma City, Oklahoma, up to 6 o'clock P. M. of the 21st day of February, 1906, for furnishing f. o. b. cars at Oklahoma City, Oklahoma, all hydrants and valves required by the city of Oklahoma City for the construction of the extensions to the C system of water-works, in accordance with the plans and specifications on file.

Specifications, instructions to bidders and blank proposals may be obtained from the city clerk of Oklahoma City, Okla., or from the consulting engineers, Kansas City, Missouri. Each bid must be accompanied by a certified check of Five Hundred (\$500) Dollars.

The city reserves the right to reject any and all bids.

[SEAL]  
GEO. HESS, City Clerk.  
BURNS & McDONNELL, Consulting Engineers,  
709-710 Dwight Bldg., Kansas City, Mo.

### Notice to Pipe Manufacturers

Sealed proposals will be received by the city clerk of Oklahoma City, Oklahoma, up to 6 o'clock P. M. of the 21st day of February, 1906, for furnishing f. o. b. cars at Oklahoma City, Oklahoma, cast iron water pipe and special castings in accordance with the plans and specifications on file.

Specifications, instructions to bidders and blank proposals may be obtained from the city clerk of Oklahoma City, Oklahoma, or from the consulting engineers, Kansas City, Missouri.

Each bid must be accompanied by a certified check of One Thousand (\$1,000) Dollars.

The city reserves the right to reject any and all bids.

[SEAL]  
GEO. HESS, City Clerk.  
BURNS & McDONNELL, Consulting Engineers,  
709-710 Dwight Bldg., Kansas City, Mo.

### Paving

Sealed bids will be received by the City Clerk, Manistee, Mich., up to 2 o'clock P. M., Thursday, March 1, 1906, for paving and combined curb and gutter on River, Smith, Maple and Washington streets.

Approximately: 2,150 sq. yds. street railway track paving, to be of brick; 14,700 sq. yds. balance of streets, to be either of brick, bitulithic or bituminous macadam, and 7,600 lin. ft. combined curb and gutter.

Proposals will be received for the entire work complete, certified check \$1,500.00, and for combined curb and gutter alone, certified check \$250.00.

Plans may be seen and specifications obtained at the office of the City Surveyor.

C. A. GNEWUCH, City Clerk.  
GEO. B. PIKE, City Surveyor.

### Sewerage System

#### CITY OF GAINESVILLE, FLORIDA.

GAINESVILLE, FLA., January 30, 1906.  
Sealed proposals will be received by the Board of Public Works of the city of Gainesville, Florida, until 3 o'clock P. M., March 7th, 1906, for constructing a Sanitary Sewerage System in the city of Gainesville, Florida, and for furnishing material for same. Work will embrace approximately twelve miles of pipe, sewers from six to fifteen inches in diameter. A certified check for One Thousand Dollars (\$1,000.00), or a satisfactory Guaranteed Bidders' Bond, must accompany each bid.

Plans and specifications will be on file and may be seen at the office of the Engineer, and copies of the specifications and forms, etc., may be obtained from the Secretary of the Board of Public Works. The right is reserved to reject any and all bids.

W. W. HAMPTON,  
Secretary Board of Public Works of the City of Gainesville, Fla.  
WM. W. LYON, Consulting Engineer.

### Notice to Contractors

Sealed bids will be received by the board of public service of the city of Elyria, Ohio, at the office of the board, until twelve (12) o'clock noon, central standard time, on Wednesday, February 28, 1906, for furnishing the necessary labor and materials for the construction of either a brick, sheet asphalt, block asphalt, or natural asphalt rock pavement in North Chestnut street, according to the plans and specifications on file in the office of the board.

Each bid must contain the full name of every person, company or corporation interested in the same, and be accompanied by a bond in the amount of five hundred dollars (\$500.00) to the satisfaction of the board, or a certified check in same amount on some solvent bank, as a guaranty that

Proposal notices continued on following page.

## Leading Manufacturers

### Of Supplies and Equipment for Municipal and Public Work

#### Brick, Paving, Building and Sewer.

W. H. Arthur, Stamford, Conn.  
Barr Clay Co., Streator, Ill.  
Bessemer Limestone Co., Youngstown, O.  
Clearfield Clay Working Co., Clearfield, Pa.  
Collinwood Shale Brick Co., Rose Bldg., Cleveland, Ohio.  
Federal Clay Products Co., 232 5th Ave., Pittsburg, Pa.  
Flint Brick & Coal Co., Des Moines, Ia.  
McAvoy Vitriified Brick Co., Philadelphia, Pa.  
Metropolitan Paving Brick Co., Canton, O.  
New England Steam Brick Co., Providence, R. I.  
Pittsburg-Brick Co., Frick Bldg., Pittsburg, Pa.  
Purinton Paving Brick Co., Galesburg, Ill.  
Suburban Brick Co., Wheeling, W. Va.  
Texas & Pacific Coal Co., Fort Worth, Texas.  
Western Brick Co., Danville, Ill.

#### Road Machinery, Rock Crushers, Etc.

Acme Road Machinery Co., Frankfort, N. Y.  
Austin Mfg. Co., Chicago.  
Buffalo Steam Roller Co., Buffalo, N. Y.  
Climax Road Machine Co., Marathon, N. Y.  
Erre Machine Shops, Erie, Pa. Asphalt Rollers.  
Kelly-Springfield Road Roller Co., Springfield, O.

#### Roofing and Roofing Material.

A. L. Barber Asphalt Co., 17 Battery Place, N. Y.  
California Asphaltum Sales Agency, Mills Building, San Francisco, Cal.  
Robt. A. Keasbey Co., 100 N. Moore St., N. Y.  
Warren Bros. Co., Boston, Mass.  
Warren Co., E. B., Washington, D. C.

#### Paving Materials (See also Brick).

A. L. Barber Asphalt Co., 17 Battery Place, N. Y.  
Bevier Improved Wood Pavement Co., St. Paul Bldg., New York.  
California Asphaltum Sales Agency, Mills Bldg., San Francisco, Cal.  
Central Bitulithic Paving Co., Detroit, Mich.  
Erimus Slag Paving Brick Co., 16 Exchange Pl., New York.  
Globe Asphalt Co., 405 Bakewell Bldg., Pittsburg, Pa.  
Southern Bitulithic Co., Nashville, Tenn.  
Standard Bitulithic Co., 253 Broadway, N. Y.  
U. S. Wood Preserving Co., 29 Broadway, N. Y.  
Wadsworth Stone & Paving Co., Pittsburg, Pa.  
Warren Brothers Co., Boston, Mass.  
Warren Asphalt Paving Co., Cambridge, Mass.

#### Sewer Pipe.

East Ohio Sewer Pipe Co., Irondale, O.  
Federal Clay Products Co., Pittsburg, Pa.  
Great Northern Sewer Pipe Co., Empire, O.  
Ohio River Sewer Pipe Co., Empire, O.  
Pittsburg-Brick Co., Pittsburg, Pa.  
Stratton Fire Clay Co., Empire, O.

#### Street Cleaning and Sprinkling Equipment.

Austin-Western Co., Chicago, Ill.  
Etnyre, E. D., & Co., Oregon, Ill.  
Sanitary Street Flushing Machine Co., St. Louis.  
Studebaker Bros. Mfg. Co., South Bend, Ind.  
Wirt & Knox Mfg. Co., 20 No. 4th St., Philadelphia, Pa.

#### Wagons and Carts.

Acme Road Machinery Co., Frankfort, N. Y.  
Austin Mfg. Co., Chicago, Ill.  
Climax Road Machine Co., Marathon, N. Y.  
Fulton & Walker Co., Philadelphia, Pa.  
Haywood Wagon Co., Baldwinville, N. Y.  
Hill Cart & Wagon Works, Jersey City, N. J.

Studebaker Bros. Mfg. Co., South Bend, Ind.  
Tiffin Wagon Co., Tiffin, Ohio.  
Troy Wagon Works Co., Troy, O.  
Watson Wagon Co., Centre & Buck Sts., Canastota, N. Y.

#### Water-Works Equipment and Supplies.

Artesian Well & Supply Co., Providence, R. I.  
Well Drilling.  
Bethlehem Fdy. & Mach. Co., South Bethlehem, Pa. Pumping Machinery.  
Buffalo Meter Co., Buffalo, N. Y. Meters.  
Central Foundry Co., 116 N. Nassau St., N. Y. Pipe.  
Hersey Mfg. Co., So. Boston, Mass. Meters.  
Jackson Filter Mfg. Co., St. Louis. Water Filters.  
Luitweiler Pumping Engine Co., Los Angeles, Cal. Pumping Machinery.  
Mueller Mfg. Co., H., Decatur, Ill. Supplies.  
Neptune Meter Co., New York. Meters.  
Pittsburg Filter Mfg. Co., Pittsburg, Pa. Filtration Plants for Water-Works.  
Pittsburg Meter Co., E. Pittsburg, Pa. Meters.  
Rife Pumping Engine Co., 111 Broadway, N. Y.  
John Simmons Co., N. Y. Supplies.  
Union Water Meter Co., Worcester, Mass. Meters.  
Washington Pipe & Foundry Co., Tacoma, Wash. Pipe, Hydrants, Valves.  
Water-Works Equip. Co., 180 B'way, N. Y. Supplies.

#### Fire Extinguishing Equipment.

American-La France Fire Engine Co., Elmira, N. Y. Fire Engines and all Fire Department Equipment.  
Eureka Fire Hose Co., 13 Barclay St., N. Y. Hose.  
Fabric Fire Hose Co., Duane & Church Sts., N. Y. Hose.  
Firestone Tire & Rubber Co., Akron, O. Rubber Tires.  
Gamewell Fire Alarm Telegraph Co., N. Y. Fire and Police Alarm Systems.  
Glazier Nozzle & Manufacturing Co., Indianapolis, Ind. Nozzles.  
Seagrave Co., Columbus, O. Apparatus and Supplies.  
Star Electric Co., Binghamton, N. Y. Fire Alarm Systems.

#### Miscellaneous.

Balto. Enamel & Novelty Co., Baltimore, Md. Enameled Signs.  
Berger Mfg. Co., Canton, O. Everything in Sheet Steel. Metal Furniture.  
Carson Trench Machine Co., Boston. Trench Machinery.  
Cleveland Street Lighting Co., Cleveland, Ohio. Street Lamps.  
Climax Supply Co., 712 Marquette Building, Chicago. Sign Posts.  
Contractors Supply & Equipment Co., Chicago. Concrete Mixers, Contractors' Supplies.  
Davison Foundry Co., 103-109 W. Monroe St., Chicago. Catch Basins.  
Hetherington & Berner, Indianapolis. Asphalt Plants.  
John Maslin & Sons, Jersey City, N. J. Contractors' Pumps.  
Okonite Co., Ltd., New York. Wire.  
Pacific Flush Tank Co., Chicago. Flush Tanks.  
Shields, W. S., 1715 Marquette Bldg., Chicago. Valves for Sewage Disposal Works.  
Soltmann, E. G., 125 E. 42d St., N. Y. Drawing Materials.  
Southern Creosoting Co., Slidell, La. Creosoted Wood.  
Southern Exchange Co., New York. Poles for Street Lighting.  
Universal Safety Tread Co., 45 Broadway, New York. Safety Treads.  
Warner Co., Chas., Wilmington, Del. Cement.  
Weber Steel Concrete Chimney Co., Marquette Bldg., Chicago. Concrete Chimneys.

When in need of Apparatus, Machinery or Supplies, consult the MUNICIPAL JOURNAL AND ENGINEER. We will promptly furnish names, addresses and full information, also catalogues or printed matter if desired.

## Proposals.

if the bid is accepted, a contract will be entered into and its performance properly secured. Should any bid be rejected, such check will forthwith be returned to said bidder, and should any bid be accepted, such check will be returned upon the proper execution and securing of the contract.

Bidders are required to use printed forms, which will be furnished upon application.

The right is reserved to reject any and all bids. By order of the board of public service.

ROSE MORIARTY, Clerk of Board.  
Dated February 8, 1906.

### Sewerage System, East of Woodbine Avenue

TORONTO, CAN.

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control,

City Hall, Toronto, up to noon on Tuesday, March 6, 1906, for the construction of Sewers, Pumping Stations, Septic Tanks and Bacteria Beds for a system of sewerage east of Woodbine avenue, Toronto, Canada.

Envelopes containing tenders must be plainly marked on the outside as to contents.

Plans may be seen, and specifications and forms of tender obtained, at the office of the City Engineer, Toronto.

The usual conditions relating to tendering as prescribed by City By-law must be strictly complied with.

The lowest or any tender not necessarily accepted.

EMERSON COATSWORTH (Mayor),  
Chairman Board of Control.

CITY HALL, TORONTO, January 24, 1906.

### Paving

#### BIDS WANTED.

Notice is hereby given that bids for paving, curbing and drain tile on Houston avenue in this

city, from the intersection of its northerly end with Ash street, to the intersection of its southerly end with Broadway street, will be received at my office until 8 o'clock P. M., March 13, 1906, said bids to be opened and considered at a regular meeting of the City Council to be held at said time.

Said paving is to be done with asphalt according to plans and specifications now on file in the office of City Engineer J. E. Carroll.

All bids must be accompanied by a certified check to the amount of \$2,000, made payable to the order of R. H. Robertson, City Treasurer, conditioned upon the execution of the contract within ten days after the award of same.

The right to reject any or all bids is reserved.

A. M. CHILDS, City Clerk.  
CROOKSTON, MINN., Jan. 26th, 1906.

### Proposals for Constructing Sewers at Lexington, N. C.

Sealed proposals will be received by the Mayor and Board of Commissioners of the Town of Lexington, N. C., until 2 o'clock P. M., February 22, 1906, for constructing a Sewerage System in the Town of Lexington, N. C., and furnishing the materials for same.

Works will embrace approximately  $5\frac{1}{2}$  miles of pipe sewers, from 8 to 15 inches in diameter.

Plans and specifications will be on file, and may be seen at the office of the Mayor, and copies of specifications, forms, etc., may be obtained from the Engineer.

The right is reserved to reject any or all bids.

JOHN H. MOYER, Mayor.

J. L. PEACOCK, Clerk.

Lexington, N. C.

Engineer: J. L. LUDLOW, Winston, N. C.

### Tenders for Electric Generators

Sealed tenders addressed to Ald. J. C. Gibson, Chairman Fire, Water and Light Committee, for supply of two 500-H. P. Electric Generators, will be received at the office of the undersigned up to 3:30 P. M., on Monday, February 26th, 1906.

Specifications and forms of tender may be obtained on application to H. N. Ruttan, City Engineer, Winnipeg, Canada.

Each tender must be accompanied by an accepted cheque or draft payable to the order of the City Treasurer, or cash deposit for the sum called for in the form of tender supplied, which will be subject to forfeiture in case of failure on the part of the contractor to enter into a written contract, with approved sureties, if called upon to do so.

The city reserves the right to reject any or all tenders or to accept any bid which appears advantageous to the City of Winnipeg.

C. J. BROWN, City Clerk.

City Clerk's Office,  
Winnipeg, Man., Jan. 10, 1906.

DENNISTON & CO.  
Builders and General Contractors.  
Rochester, N. Y.

JAMES A. HART COMPANY  
General Contractors  
Home Life Ins. Bldg., 256-7 Broadway, New York

JOHN MAHONEY  
Paving and Building  
Jamestown, N. Y.

WHITMORE, RAUBER & VICINUS  
Pavements, Sewers and General Contracting  
279 South Ave., Rochester, N. Y.

LEGRAND BROWN  
Mem. Am. Soc. C. E., Electric Railways and Pavements. Rochester, N. Y.

I. W. HOWARD, C. E., E. M.  
PAVEMENT EXPERT AND TESTING  
LABORATORY.  
1 Broadway, New York

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For general contracting purposes; made with steel axles; 3 or 4 inch tire; bottom of reinforced steel plates, one overlapping the other, so that there can be no leakage of load;  $1\frac{1}{2}$  to 5 yard capacity. Guaranteed against defective material or workmanship. Full description and price on request.

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CAPACITY OF BRICK, TEN MILLION ANNUALLY. CAPACITY OF SEWER PIPE, FIVE THOUSAND FEET DAILY.



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ANY LENGTH OR QUANTITY

For Town or City Electric Light Plants

SOUTHERN EXCHANGE CO., 97 Warren St., N. Y.

## The Ideal Pavement THE BITULITHIC PAVEMENT

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Fire and Police Alarms and Signal Systems

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## SAFES *Fire and Burglar Proof*

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SAFETY  
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¶ The Mosler Safe Co.'s Patented Safes are in general use by Municipal Officials, Merchants, Corporations and Bankers all over the World. ¶ The UNITED STATES and MEXICAN GOVERNMENTS use the Mosler Patented Safes for the protection of their moneys and valuables. :: :: :: :: :: ::

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IN USE IN MUNICIPAL, COUNTY, STATE AND FEDERAL BUILDINGS THROUGHOUT THE COUNTRY, BEING EXPLICITLY AUTHORIZED BY THE POST OFFICE DEPARTMENT UNDER PROVISION OF A SPECIAL ACT OF CONGRESS. AS A PART OF THE POSTAL SYSTEM IT IS AVAILABLE FOR THE SERVICE OF SUCH PAPERS AS MAY BE LEGALLY SERVED THROUGH THE MAIIS.



MODEL C, OPEN

WHERE THE STANDARD AUTHORIZED MAIL CHUTE EQUIPMENT IS DESIRED, THE CUTLER MAILING SYSTEM SHOULD BE SPECIFIED BY NAME.

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GENERAL OFFICES, CUTLER BUILDINGS, ROCHESTER, N. Y.

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